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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/788,891	02/27/2004	Paul S. Palumbo	99097CIPCON	4560

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Cabot Corporation
Law Department
157 Concord Road
Billerica, MA 01821

EXAMINER

SHOSHO, CALLIE E

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 05/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/788,891

Applicant(s)

PALUMBO ET AL.

Examiner

Callie E. Shosho

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5-15,17,18,21-25,34,35 and 40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,5-15,17,18,21-25,34,35 and 40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1, 5-15, 17-18, 21-25, 34-35, and 40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites that the first chemical group, second chemical group, and third chemical group each comprises at least one organic group selected from the group consisting of “acyl azides, isocyanates,, and salts and derivatives thereof”. The scope of the claim is confusing because it is not clear that is meant by “derivatives” or what types of organic groups are encompassed by this phrase. Similar questions arise in claim 40 which also recites “derivatives” with respect to the first chemical group, second chemical group, and third chemical group.

Similarly, claim 9 recites that the polymer is selected from the group consisting of “a polyamine, a polyalkylene oxide, a polyol, a polyacrylate, and salts and derivatives thereof”. The scope of the claim is confusing because it is not clear what is meant by “derivatives” or what types of polymers are encompassed by this phrase. Similar questions arise in each of claims 17 and 25 which also recite “derivatives” with respect to the polymer.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1 and 8-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Moffatt et al. '932 (U.S. 6,221,932) taken in view of the evidence in *Organic Chemistry*.

Moffatt et al. '932 disclose a method of making a modified pigment comprising reacting a pigment having attached aromatic ester group with polymer such as polyethylene glycol, polyamine, or polyethyleneimine. The reaction occurs by nucleophilic substitution (col.4, line 29-col.5, line 41, col.6, lines 50-60, and col.7, lines 53-58).

It is noted that Moffatt et al. '932 disclose that the aromatic ester group undergoes nucleophilic substitution and not addition-elimination reaction as presently claimed. However, this does not mean that the aromatic ester group does not or cannot undergo addition-elimination reaction. Evidence to support this position is found in *Organic Chemistry* (pages 1035 and 1048-1049), which discloses that elimination-addition is a specific type of nucleophilic substitution or specific mechanism used in nucleophilic substitution.

In light of the above, it is clear that Moffatt et al. '932 anticipate the present claims.

5. Claims 1, 5, 8-9, 12, 14-15, 17-18, and 40 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 99/31175.

WO 99/31175 discloses a method of making a modified pigment comprising reacting carbon black pigment which has attached organic group which has attached ionic group with at least one polymer which attached to the ionic group. It is disclosed that the polymer includes polyamide or polyacrylate and the organic group includes amide group, aromatic group, aliphatic group derived from ketone or aldehyde, and alkyl sulfate (page 4, line 22, page 5, lines 16-27, page 6, lines 4-28, page 11, lines 3-15, page 12, line 14-page 13, line 2, page 13, lines 7-10, and page 16, lines 8-13).

In light of the above, it is clear that WO 99/31175 anticipates the present claims.

6. Claims 1, 8-10, 12-13, and 40 are rejected under 35 U.S.C. 102(e) as being anticipated by Kwan (U.S. 6,235,829).

Kwan discloses a method for making a modified pigment comprising pigment which has functional group such as amino or epoxy with polymer which has reactive group such as isocyanate, amine, or amide. The pigment includes carbon black as well as organic pigment such as yellow pigment, red pigment, etc. The polymer includes polyacrylate and those obtained from aldehyde containing monomers or amine or amide containing monomers (col.2, lines 30-50 and 58-59, col.3, lines 1-34, 38, and 43-54, and col.4, lines 6-8).

In light of the above, it is clear that Kwan anticipates the present claims.

7. Claims 21-22, 24, 34-35, and 40 are rejected under 35 U.S.C. 102(e) as being anticipated by Moffatt et al. '257 (U.S. 6,323,257).

Moffatt et al. '257 disclose modified pigment and ink jet ink comprising modified pigment wherein the modified pigment has attached at least one directly attached organic group which is the reaction product of (2-sulfatoethyl)-sulfone group and at least one nucleophilic polymer such as those obtained from ester of acrylic acid, i.e. polyacrylate, and containing polyalkylene glycol (col.4, lines 12-23 and 42-42, col.6, lines 6-12 and 30, col.12, line 20, col.13, lines 15-25, col.16, lines 25-30, and table bridging cols. 5-6/7-8).

In light of the above, it is clear that Moffatt et al. '257 anticipates the present claims.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moffatt et al. '257 (U.S. 6,323,257).

The disclosure with respect to Moffatt et al. in paragraph 7 above is incorporated here by reference.

The difference between Moffatt et al. '257 and the present claimed invention is the requirement in the claims of specific type of (2-sulfatoethyl) sulfone group.

Moffatt et al. '257 disclose the use of phenyl (2- methyl ethyl sulfanato) sulfone while the present claims require the use of phenyl (2-sulfatoethyl) sulfone. Thus, the compound of Moffatt et al. '257 contains a methyl substituent not present on the instantly claimed compound.

Given the similarity between the claimed compound and that disclosed by Moffatt et al. '257 and given that the compound of Moffatt et al. '257 is used as a first chemical group on a pigment which is then reacted with second chemical group, which is the identical function of the presently claimed compound, it would have been natural for one of ordinary skill in the art to infer that the presently claimed compound is just an obvious variant of that in Moffatt et al. '257

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and to expect that the phenyl (2- methyl ethyl sulfanato) sulfone of Moffatt et al. '257 would have similar properties as the phenyl (2-sulfatoethyl) sulfone presently claimed.

In light of above, it therefore would have been obvious to one of ordinary skill in the art that the phenyl (2-sulfatoethyl) sulfone disclosed in the present claims is but an obvious variant of the phenyl (2- methyl ethyl sulfanato) sulfone disclosed in Moffatt et al. '257, and thereby one of ordinary skill in the art would have arrived at the claimed invention.

11. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moffatt et al. '257 (U.S. 6,323,257) in view of Moffatt et al. (U.S. 6,221,932).

The disclosure with respect to Moffatt et al. in paragraph 7 above is incorporated here by reference.

The difference between Moffatt et al. '257 and the present claimed invention is the requirement in the claims of specific type of polymer.

Moffatt et al. '932, which is drawn to ink composition comprising modified pigment, disclose attaching polymer such as polyethyleneimine to pigment in order to produce an ink with increased smearfastness, enhanced print quality, and improved bleed control. Moffatt et al. '932 further disclose the equivalence and interchangeability of polyalkylene glycols, as disclosed by Moffatt et al. '257, with polyethyleneimine (col.1, lines 15-23, col.5, lines 43-44, 53, and 63-65, and col.6, lines 45-55).

In light of the motivation for using specific type of polymer disclosed by Moffatt et al. '932 as described above, it therefore would have been obvious to one of ordinary skill in the art to use such polymer in the pigment of Moffatt et al. '257 in order to produce an ink with

increased smearfastness, enhanced print quality, and improved bleed control, and thereby arrive at the claimed invention.

12. Claims 1, 5-9, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moffatt et al. '257 (U.S. 6,323,257) in view of WO 99/31175.

Moffatt et al. '257 disclose a method of producing a modified pigment comprising reacting first chemical group such as (2-sulfatoethyl)-sulfone group with second chemical group, i.e. nucleophilic polymer such as polyalkylene glycol, in order to form third chemical group, (col.4, lines 12-23 and 42-42, col.6, lines 6-12 and 30, and col.16, lines 25-30).

The difference between Moffatt et al. '257 and the present claimed invention is the requirement in the claims (a) that the first chemical group is attached to the pigment using diazonium salt and (b) specific type of (2-sulfatoethyl) sulfone group.

With respect to difference (a), Moffatt et al. '257 is silent with respect to how the first chemical group is attached to the pigment.

WO 99/31175 discloses attaching chemical groups to carbon black by using diazonium salt. It is further disclosed that this method is used given that diazonium salt can react with carbon black in a variety of reaction conditions and in any type of reaction medium and further given that diazonium salt is compatible with wide variety of functional group (page 4, lines 20-24, page 7, lines 2-4, and page 9, lines 14-16).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use diazonium salt to attach the first chemical group to the pigment of Moffatt et al. '257, and thereby arrive at the claimed invention.

With respect to difference (b), Moffatt et al. '257 disclose the use of phenyl (2- methyl ethyl sulfanato) sulfone while the present claims require the use of phenyl (2-sulfatoethyl) sulfone. Thus, the compound of Moffatt et al. '257 contains a methyl substituent not present on the instantly claimed compound.

Given the similarity between the claimed compound and that disclosed by Moffatt et al. '257 and given that the compound of Moffatt et al. '257 is used as a first chemical group on a pigment which is then reacted with second chemical group, which is the identical function of the presently claimed compound, it would have been natural for one of ordinary skill in the art to infer that the presently claimed compound is just an obvious variant of that in Moffatt et al. and to expect that the phenyl (2- methyl ethyl sulfanato) sulfone of Moffatt et al. '257 would have similar properties as the phenyl (2-sulfatoethyl) sulfone presently claimed.

In light of above, it therefore would have been obvious to one of ordinary skill in the art that the phenyl (2-sulfatoethyl) sulfone disclosed in the present claims is but an obvious variant of the phenyl (2- methyl ethyl sulfanato) sulfone disclosed in Moffatt et al. '257, and thereby one of ordinary skill in the art would have arrived at the claimed invention.

13. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moffatt et al. '257 in view of WO 99/31157 as applied to claims 1, 5-9, and 12 above, and further in view of Moffatt et al. (U.S. 6,221,932) .

The difference between Moffatt et al. '257 and the present claimed invention is the requirement in the claims of specific type of polymer.

Moffatt et al. '932, which is drawn to ink composition comprising modified pigment, disclose attaching polymer such as polyethyleneimine to pigment in order to produce an ink with increased smearfastness, enhanced print quality, and improved bleed control. Moffatt et al. '932 further disclose the equivalence and interchangeability of polyalkylene glycols, as disclosed by Moffatt et al. '257, with polyethyleneimine (col.1, lines 15-23, col.5, lines 43-44, 53, and 63-65, and col.6, lines 45-55).

In light of the motivation for using specific type of polymer disclosed by Moffatt et al. '932 as described above, it therefore would have been obvious to one of ordinary skill in the art to use such polymer in the pigment of Moffatt et al. '257 in order to produce an ink with increased smearfastness, enhanced print quality, and improved bleed control, and thereby arrive at the claimed invention.

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Devonport (U.S. 6,372,820) discloses pigment having attached polymer, however, there is no disclosure of first chemical group, second chemical group, and third chemical group as presently claimed or any disclosure that the pigment has attached organic group that is reaction product of (2-sulfatoethyl)-sulfone group and nucleophilic polymer as required in present claims 21 and 34.

Johnson et al. (U.S. 6,336,965) disclose modified pigment having attached polymer.

Tsang et al. (U.S. 6,150,433) disclose modified pigment produced by attaching polymerizable olefinic groups on the pigment followed by reaction with polymer.

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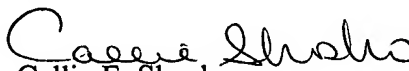
Ikeda et al. (U.S. 5,952,429) disclose method for making a modified pigment comprising reacting a pigment which comprises a functional group with polymer which comprises reactive group using electrophilic or nucleophilic addition to form pigment having polymer attached through covalent bond such as amide bond. However, there is no disclosure that the carbon black functional group is organic group as required in present claims 1 or 40 or (2-sulfatoethyl)-sulfone group as required in present claims 21 and 34.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 571-272-1123. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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5/5/06


Callie E. Shosho
Primary Examiner
Art Unit 1714